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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,058	07/21/2006	Floran Prades	F-891	8986

25264 7590 07/01/2009

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EXAMINER	
CORNO JR, JAMES A	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
07/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,058	PRADES ET AL.	
	Examiner	Art Unit	
	JAMES CORNO	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed March 25, 2009, have been fully considered but they are not persuasive.

Regarding applicant's assertion that the application should be considered as a national stage application under 35 USC 371, MPEP 1893.03(a) states that

> "if there are any conflicting instructions as to whether the filing is under 35 U.S.C. 111(a) or 35 U.S.C. 371, the application will be accepted as filed under 35 U.S.C. 111(a). A conflicting instruction will be present, for example, where applicant includes in the initial submission under 35 U.S.C. 371, a "Utility Patent Application Transmittal" (Form PTO/SB/05) or includes a benefit claim under 35 U.S.C. 120 to the international application."

In this case, the application was originally submitted as filed under 35 USC 111(a). Although the oath filed on October 14, 2008 makes it appear that the case is a 371 of the PCT, none of the papers present on filing indicate this, so this was not treated as a 371. Also, no foreign priority has been granted since there is more than one year from the filing of the PCT to the filing of the present application.

Regarding applicant's assertion that Saudemont teaches away from the claimed invention, Saudemont indicates that the "direct use of aluminum and/or magnesium fluorides presents *difficulties which are barely surmountable*" (emphasis added), which clearly leaves room for the possibility that these materials may be usable, especially in light of the fact that Best demonstrated successful functionalization of a material (Davison 952) that satisfies all of the requirements of Saudemont (claims 3-6). The

Saudemont authors' ignorance of the results of Best does not make the references incompatible.

Regarding applicant's assertion that Saudemont does not indicate that aluminum and magnesium fluorides are functional equivalents, it should be noted that Saudemont repeatedly refers to "aluminium and/or magnesium Lewis acid sites," clearly indicating that either aluminum, magnesium, or a combination of the two may be used successfully for the functionalization of the catalyst support structures. See, for example, the abstract or claims 9, 11, and 12.

Regarding applicant's assertion that neither Best nor Saudemont teaches the presence of fluorine atoms directly bonded to the aluminum atoms, Best teaches functionalization through the use of alkyl aluminum fluorides, which would necessarily produce aluminum atoms directly bonded to fluorine atoms on the surface, and Saudemont specifically indicates that the aluminum on the surface is at least partially fluorinated (col. 2, lines 37-39).

Regarding applicant's assertion that insufficient reasoning was provided in the rejection of claim 37, it should be noted that the exact wording of the rejection was, "It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the vanadium-containing catalysts of Best with a metallocene catalyst of Saudemont with a reasonable expectation of success." This implies both that one of ordinary skill in the art could have made the substitution (obvious to one of ordinary skill in the art) and that the results would have been predictable (with a reasonable expectation of success). The combination was not unreasonable because both

references were teaching the porous silica particles with identical properties functionalized with fluorinated aluminum to support catalysts for the polymerization of olefins. In addition, the second rejection of claim 37 (over Saudemont in view of Best) requires no such reasoning.

Regarding applicant's assertion that Saudemont does not teach a metallocene catalyst comprising a group 4 metal and a cyclopentadienyl group, see col. 5, lines 32-51 of Saudemont, in which the metallocene is indicated as preferably including a group 4 metal (Ti, Zr, or Hf) and a cyclopentadienyl ligand. In addition, every example provided by Saudemont satisfies this requirement.

The rejections are maintained and made final.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 23-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Best (US Patent No. 4,607,019) in view of Saudemont et al. (US Patent No. 6,239,059). Best teaches a catalyst support for polymerization of olefins comprising porous silica functionalized by contact with diethyl aluminum fluoride (example 20). Best does not teach the heating steps for pyrolysis or oxidation of these functionalized silica particles. Saudemont teaches that oxidizing such particles at 200-600°C advantageously

increases surface acidity (col. 4, lines 60-65). Saudemont also teaches that any such oxidation should be preceded by pyrolysis in an inert atmosphere to remove alkoxy groups, which would react unfavorably with oxygen during the oxidation step (col. 4, lines 57-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to subject the particles of Best to a pyrolysis to remove alkoxy groups and subsequent oxidation step in order to increase surface acidity without introducing water.

Regarding claims 24-25, Best teaches the use of silica particles as supports (example 15).

Regarding claims 26-27, Saudemont teaches that pyrolysis should be performed at 200-600°C, with a specific example of 450°C.

Regarding claims 28-32, Best teaches the use of diethyl aluminum fluoride (example 15).

Regarding claim 33, neither Best nor Saudemont teaches the use of a combination of a fluoroorganoaluminum with an alkylated and/or fluorinated group II metal to activate the catalyst support. However, both Best (col. 2, lines 1-9) and Saudemont recognize that magnesium is also useful for activating the support structures. Saudemont gives a specific example of $MgBu_2$ as a functionalizing agent (col. 9, line 37). It would have been obvious to one of ordinary skill in the art at the time of the invention to use any combination of compounds known to successfully activate the supports, including the fluororganoaluminum compounds of Best and the organomagnesium compounds of Saudemont ("It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose,

in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980)).

Regarding claims 34-35, Best gives examples in which the silica support is Davison 952, which has a specific surface area of 280 m^2/g, porosity of 1.60 cm^3/g, pore diameter of 20 nm, and particles sizes of ~50 μm, all of which are within the claimed ranges.

Regarding claim 36, the process of Best in view of Saudemont would produce fluorine atoms directly bonded to aluminum atoms.

Regarding claims 37-38, Best does not teach the use of a metallocene catalyst with the support. However, Saudemont teaches that the use of metallocene catalysts with such supports for the polymerization of olefins is well-known in the art (Background of the Invention; entire disclosure). It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the vanadium-containing catalysts of Best with a metallocene catalyst of Saudemont with a reasonable expectation of success.

Regarding claims 39-40, Best teaches the addition of triisobutylaluminum to the catalyst system (example 15). Alternatively, Saudemont teaches the addition of triisobutylaluminum (example 5) or triethylaluminum (example 7) as a cocatalyst.

Regarding claim 41, Best teaches addition of the support to a solution of the catalyst in hexane. Alternatively, Saudemont teaches mixing the support with the catalyst in heptane.

Regarding claim 42, Best teaches the addition of triisobutylaluminum to the catalyst system (example 15). Alternatively, Saudemont teaches the addition of triisobutylaluminum (example 5) or triethylaluminum (example 7) as a cocatalyst.

Claims 23-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saudemont in view of Best. Saudemont teaches a metallocene catalyst support for the polymerization of olefins functionalized with fluorinated aluminum produced by pyrolyzing and oxidizing. Saudemont does not teach the use of a fluorinated functionalizing agent, stating, "The direct use of aluminium and/or magnesium fluorides presents difficulties which are barely surmountable in terms of forming a support having suitable particle-size and porosity properties" (col. 2, lines 20-23). However, this implies that the direct use of the fluorinated functionalizing agents would be preferable if the technical difficulties were overcome. Best teaches a method of producing catalyst supports for the polymerization of olefins in which porous oxide particles meeting Saudemont's requirements are functionalized with diethyl aluminum fluoride (example 15). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fluoridated functionalizing agents according to the method of Best in the process of Saudemont in order to eliminate the need for a fluoridation step.

Regarding claims 24-25, Saudemont teaches the use of silica particles as supports (example 1).

Regarding claims 26-27, Saudemont teaches that pyrolysis should be performed at 200-600°C, with a specific example of 450°C (example 1).

Regarding claims 28-32, Best teaches the use of diethyl aluminum fluoride (example 15).

Regarding claim 33, neither Best nor Saudemont teaches the use of a combination of a fluoroorganoaluminum with an alkylated and/or fluorinated group II metal to activate the catalyst support. However, both Best (col. 2, lines 1-9) and Saudemont recognize that magnesium is also useful for activating the support structures. Saudemont gives a specific example of $MgBu_2$ as a functionalizing agent (col. 9, line 37). It would have been obvious to one of ordinary skill in the art at the time of the invention to use any combination of compounds known to successfully activate the supports, including the fluororganoaluminum compounds of Best and the organomagnesium compounds of Saudemont ("It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980)).

Regarding claims 34-35, Best gives examples in which the silica support is Davison 952, which has a specific surface area of 280 m^2/g, porosity of 1.60 cm^3/g, pore diameter of 20 nm, and particles sizes of ~50 μm, all of which are within the claimed ranges. In addition, Saudemont teaches that ideal support particles have at least one of 7.5-30 nm pore diameters, 1-4 cm^3/g porosity, 100-600 m^2/g specific surface area, and 1-10 μm particle diameter.

Regarding claim 36, the process of Saudemont in view of Best would produce fluorine atoms directly bonded to aluminum atoms.

Regarding claims 37-38, Saudemont teaches the use of the particles as metallocene catalyst supports.

Regarding claims 39-40, Best teaches the addition of triisobutylaluminum to the catalyst system (example 15). Alternatively, Saudemont teaches the addition of triisobutylaluminum (example 5) or triethylaluminum (example 7) as a cocatalyst.

Regarding claim 41, Best teaches addition of the support to a solution of the catalyst in hexane. Alternatively, Saudemont teaches mixing the support with the catalyst in heptane.

Regarding claim 42, Best teaches the addition of triisobutylaluminum to the catalyst system (example 15). Alternatively, Saudemont teaches the addition of triisobutylaluminum (example 5) or triethylaluminum (example 7) as a cocatalyst.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Han et al. (*Polymer* **49**, p. 4141-4149, 2004) and McDaniel both disclose structural details of the Davison 952 silica support used by Best.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES CORNO whose telephone number is (571)270-5829. The examiner can normally be reached on Monday-Thursday 9:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAMES CORNO/
Examiner, Art Unit 1793

June 28, 2009

/Melvin Curtis Mayes/

Supervisory Patent Examiner, Art Unit 1793